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Oct.-Nov., 1933 10 Cents

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Virginia:

"Those blocks in our experimental orchards that have received complete fertilizer for the past ten years are now outgrowing and outyielding other blocks. This is explained by the greater amount of organic matter produced and eventually added to the soil."

Pennsylvania:

"The value of nitrogen as the sole ingredient of an orchard fertilizer has been greatly overstressed. The plots which have received a complete fertilizer are obviously superior, in growth of cover crop or sod, in vigor of trees, and in yields, to plots which have received nitrogen only."

New Jersey:

"A complete fertilizer has always been recommended for tree fruits in New Jersey. For the past few years the Horticultural Department has recommended that in general apple growers consider as a basic fertilizer treatment, the annual use of 75 to 100 pounds of Muriate of Potash and 400 to 500 pounds of Superphosphate per acre, with the addition of nitrogen-containing fertilizers according to the needs of the variety and the orchard."

WHEN there is a deficiency of organic matter in your orchard soil: "fruit spur and terminal growth is short, the bark becomes tight, the fruit does not size up, much of the fruit cracks in summer when dry spells are followed by rains, die-back or rosette appears on the terminals, more top and root injuries occur in winter and in many cases the addition of nitrogen fertilizers gives very little response."

Don't wait for your orchard to show these signs. Plan now to use a well-balanced fertilizer. Get a luxuriant growth of alfalfa or clover. These deep-rooted cover crops carry organic matter and the essential mineral elements —potash, phosphorus and lime—to the lower root-feeding zones where the trees readily take them up. This increases the yield of high-quality fruit of better size and color and improves the foliage and tree vigor of your orchard.

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19 West 44th Street
NEW YORK CITY

Better Crops with PLANT FOOD

The Whole Truth—Not Selected Truth

R. H. STINCHFIELD, *Managing Editor* SID NOBLE, *Editor*

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Agricultural and Scientific Bureau

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Again, We Give Thanks.

Better Crops with PLANT FOOD

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VOL. XIX NEW YORK, OCT.-NOV., 1933 No. 4

Jeff says—"There must be co-operation in cow-operation."

Cows *and* Codes

By Jeff McDermid

THE purple cow of Burgess' fancy, the sacred bulls of Bashan, and the golden calf that Moses busted have nothing on our modern bovines in the spotlight of economic experiment.

In my barefoot days I lived humbly with cows in clover. In later years on the prairies we kept cows in corrals. I have seen cows in auction rooms, on floats in lactic pageantry, and in the gilded stables of Croesus. I have observed them in antiseptic milking parlors and watched them being clipped, oiled, waxed, curled, and manicured. I have seen them tested, pedigreed, weighed, and spayed. In short, until this season I was prepared for anything and everything to be done for, by, to, and with the cow—but so help me, the last barriers are broken down, and the ultimate is here!

Lean forward with bated breath for the latest scandal from the front. They have put cows in codes!

They tried it with pigs, but it didn't take. The sheep, lamb, and goat supply has all been utilized in Wall street. But, as the nation boasted some twenty-five million "milch" cows and "milch" is an article of commerce "inextricably intermingled," (but un-

accountably oversupplied) the only answer thus far has been to codify the country's dear old wet-nosed four-legged foster mother. She is no longer merely a scrub, or a native, or a Holstein, or something, but she is Exhibit A.

OH it's absolutely true and it's too late to do anything about it. She is snubbed up close to the legal manger and is being fed balanced rations consisting of more whereases and/or hereinunders than any blessed old bossy since Noah loaded the ark. Each bright morning the Federal boulevard is cluttered with eager young milkmen with Yale degrees, each dedicated to codifying the cow.

For every flap of the Blue Eaglet there is a glorious drip from the udder. But the eagle flaps for nothing, and it takes alfalfa to keep the cows contented. Hence if there must be codes for the one, there should be cuds—and codes—for the other. The farmer supplies the *cuds* and the lawyer provides the *codes*.

Thus mutually responsible, we tackle the milk problem on all fronts, being careful to do our most meticulous work on the southeast corner of the starboard side, lactitude unknown.

Personally, I favor this honor done to the cow. Why should she not become a rallying point for heated debate when she has for so long been expected to "give down" and shut up? We have brought all sorts of queer problems to Washington to scrap over and had queerer folks doing the scrapping. I think it is high time to inject a little bucolic sentiment into the picture, and believe me the old cow as I know her packs plenty of sentiment as well as just ordinary scent. You can get more sober folks all het up over the cow question than a dozen bridge tournaments or world series instil, especially if you talk cost of production and milk trusts. But this is getting ahead of my proper sequence.

Indeed, the plain rural cow has struck her gait, and she pastures in mighty mixed company these days when it comes to codes. Just to indicate the variety of commodities with which she is indexed on the road to recovery, I fumble through a fresh file from over yonder in General Johnson's department.

Here we have one day's edition of codes of fair competition as revised, annotated, and rubber-stamped, all ready to accompany the cow for another day of grazing. Here we have, if you please, codes for ocean pearl buttons, jeweled watches, end grain strips, men's garters, brassieres, tile and mantel arts and crafts, furring and lathing, real estate, knitted underwear, carpet padding, bolts, nuts, and rivets, fashion studios, cast-iron boilers, hospital furniture, aluminum fabricating, barbers, outdoor advertising, apartment-house janitors, armored cars, sausage casing, and millinery; and for making the cow feel natural, codes for silos, hides, and evaporated milk.

BUT you can take all the aforementioned codes in one big bundle and they won't get the publicity that our friend the mooly cow garners in a week. Why, she stands in the papers right alongside the steel trust and the coal barons when it comes to public interest. Leave it to the folks back home who joined the Holiday Association to attend to that. They have sent the old cow down here to represent them, as a symbol, I mean. Of course you can't really find a cow within some distance of Washington, which is one reason why our milk costs so much and tempts the editorial writers so often. She is here in spirit even while she remains on the ranch and adds to the crop of calves, the vats of unsold cheese, and the surfeit of butter. In short, her base is in Washington and her surplus is everywhere.

Before attaching a code to the cow's tail, it was advisable to look at a for-

mula. This formula merely stated what we knew before, namely, that given a lower unit price for milk and a higher unit price for overalls and eating tobacco, the precious old cow must turn herself inside out to out-spurt her former udder efforts. And when cow prices dropped to where anybody with a wisp of hay and a milk-stool could own one, performance counted more than pedigrees.

After conjuring awhile on this prob-

lem and the riddle of how to hold back the torrent of milk, it was decided to put the cow into a convenient place to harness her for the codes. And that convenient spot happened to be a "milk shed."

So we all foregathered in the milk shed, using law-books for herd-books. I am unaware who coined the term "milk shed" to define the place in question. It certainly is not like a watershed, for obvious reasons. And the existent health rules will not tolerate the use of an ordinary lean-to shed as a place in which to twist out the lactic juices for such high-toned areas. But "milk shed" it is and you'll have to put up with it.

I EXPECT you should be legally introduced to the cast. They are the "contracting parties" and the stage on which they intend to do the milking is called "sales area" and "production area." Way back in the wings we keep a stage-hand to rattle the thunder machine and to flash the lightning betimes. This inconsequential party is caled the "consumer." He is merely there to furnish background and local color. But he grumbles by proxy sometimes and thinks he ought to write the drama.

"Contracting producers" mean a group of fellows who decided years ago that cow-operation and co-operation belonged together instead of being exploited separately. They gravitated around milk sheds and built up protective walls to keep out the milk produced by other cooperators in the manufactured zones. When the glass tank cars entered the picture and milk came from greater distances, the cooperatives set up base and surplus plans for economic control and bacteria-counting experts for physical control. This displeased the exponents of the open market, flat prices, and flies in the strainer. Their idea was to buy every heifer in sight, work their families to death, dump every drop on the city market, and demand fifty per cent of the retail price or better—or else take cost of production based on the highest estimate on hand and strike if the public refused to pay it. Hence when you say "cooperating producers" now, you mean what are left of the original gang who have managed to resist the pleas and clubs of the nonconformists.

"CONTRACTING distributors" mean whatever you choose to name them. They may be snipers, malefactors of entrenched privilege, greedy cream-skimming slickers, exponents of the classified racket, members of the milk monopoly; *or* they may prove to be harassed managers obliged to cater to the morning demands of thousands, with arrogant labor unions, broken bottles, stalled motors, and cutthroat competition to face.

"Spreads" are what watchful zealots for the public weal carefully scan when trades and agreements are brewing. One idea is to narrow the spread

to quash the trust, and what often happens is that you play into the hands of those best able to trade on decimal fractions because of preponderant volume. Just how one may put a foot on a farm and another in town and not spread some in the process has not been fully explained. Maybe if the producers would don suits of mail and use some of their idle trucks and husky sons to bust the grip of the milk drivers a litle nick might be made in the w. k. spread. Or we can return to the days when every farmer toted his milk to town and dispensed it from fly-specked pitchers.

"PRODUCER - DISTRIBUTOR" means a man who is too blamed independent to take what the market offers in a group. He helps himself to "parity" and uses as much oleo as he pleases either on pancakes or pistons. When you talk surplus to him, he says he has none. You can't pin him down as a distributor because he is a producer, and you can't get him het up on farm distress because he cashes in on milk tickets and snaps his fingers at the pitch-forking spellbinders. The only way to get his nanny is to inform him that he and his cows are codified and that hereafter his milk must sell above a minimum.

"Production area" means and signifies almost invariably a rural territory so badly hit by drought that even the milk has to be watered, where every teat is mortgaged, and every calf has the scours.

"Sales area" is the region bounded on the one hand by the chain store and on the other by the roadside stand, wherein there is the sunrise advent of the bewildered milkman and his nag, fifteen to a city block, doing yeoman duty as distributors but reneging on the job as collectors.

Perhaps you imagine that all is clear navigating after the "contracting parties" are ready, and that when you say "agreement" you mean agreement —the synonyms for which are harmony, accord, and brotherly love.

However, and nevertheless, be not misguided by our popular Nervous Restless Attitude. The contracting parties are often frustrated by the "contrary parties." There's more to this milk business than a can, a customer, and the barn-yard pump.

Folks who are about as well teamed up as Primo Carnera and Mahatma Gandhi or as mutually sympathetic as Hugh Samuel Johnson and Henry Ford are expected to lay aside their warpaint and come peaceably to be glossed over with the lacquer of resolve and the varnish of resignation.

Men whose mutual hatreds for a decade have turned freshly-drawn, double A grade milk into curdy clabber in a split second; who have tormented each other's organizations over the backs of innocent kine during the delightful days of rural cooperation—these are the belligerent and stubborn cohorts who thrust themselves into the dairy agreements. And if nobody gets killed or no profits are cut, the fracas will be a victory for all!

BUT you fail to have a true index to the situation by that inference alone. The scrappy and prejudiced attitudes of many erstwhile native-born and true-blue cooperators and their associates on the selling end had been worn down pretty blunt by the exigencies of the hour. The irresponsible third party, the last vestige of the laissez-faire era, the price-shaving demon—he it is who united the warring factions when decent methods failed to bring peace. He auctioned off the cream and peddled out the milk. He gave premiums and sold loss leaders. Nothing but a code could hold him from removing the breeches and the socks from the industry. When one is exposed with recumbent pants, one has to step lively or get swatted.

The "chiseler" nicking his grooves in price levels is a result of the bad

(*Continued on page* 31)

Left—no treatment. Right—200 lbs. 45% superphosphate, 200 lbs. muriate of potash, and two tons of lime per acre. The fertilizer doubled the yield and returned the investment with 380 per cent profit.

Interest—300%

By C. J. Chapman

Professor of Soils, Wisconsin College of Agriculture

A FARMER who can make a profit on any investment, with prices for farm produce where they are, may well be looked upon as some sort of a magician. But, unbelievable, as it may sound, there are still investments that a farmer can make which will pay a handsome profit. If I were to tell you that by investing $10 per acre in fertilizers for alfalfa a farmer with whom I am well acquainted made 380 per cent interest on his investment within a period of three years, you probably would say it couldn't be done, but I am going to present the facts.

And I want to say right now that there is no crop grown in the State of Wisconsin at the present time which offers greater opportunity for the profitable use of fertilizers than alfalfa. A ton of alfalfa hay is worth more than the average ton of milk at present prices. Alfalfa is one commodity that has not fluctuated in price to any considerable extent during the past few years. There is no surplus of good alfalfa on our dairy farms today; in fact, less than 15 per cent of our hay acreage in Wisconsin is devoted to the alfalfa crop.

My enthusiasm has been quickened by the past three years of dry weather. Alfalfa has come through in most cases, while clover and timothy seedings have failed by the thousands of acres. The total hay crop harvested in Wisconsin in 1932 was two million tons short of the five-year average. I recommend fertilizers for alfalfa and clover seedings this coming spring without hesitation under a wide range of soil conditions in Wisconsin, and

firmly believe that such a practice is sound and economical.

I am going to tell you now the story of a farmer who had to be shown first that money invested in fertilizers for alfalfa would pay. Alfalfa on his farm had been a fickle and rather uncertain crop. He could get a catch and a fair yield for a year or two, but it soon faded out of the picture, yields would drop, and it generally met with an early death, due to starvation and winter-killing. This farmer lives at Mazomanie, Wisconsin. His little farm is located on the edge of the village. The soil is a sandy loam. I am especially interested in this farm and in the farmer as well. In the early days I presume this interest was centered around one of his good-looking daughters, but for the past 13 years, more because Joseph Sharratt is my father-in-law. At any rate, I wanted to see some good alfalfa on this farm, and I set out to show that it was possible to grow it.

In the spring of 1928 I took samples of soil from the field he proposed to seed to alfalfa. We analyzed these samples in our laboratory for total nitrogen, total phosphorus, available phosphorus, total potassium, and acidity. We also took subsoil samples from this field and tested them. For results of these analyses see Table I.

The subsoil at two feet was calcareous, showing no acidity at all. In fact, it contained limestone gravel.

These analyses indicated that this soil was very low in its content of available phosphorus, and I was reasonably sure that it needed potash as well. Sixteen thousand pounds of total potassium is considered low. The need for lime was not so clearly indicated. While the surface soil showed a slight-plus degree of acidity, yet the subsoil was less acid, and at two feet contained an abundance of lime. The treatment then, I decided, should include both phosphate and potash, and in order to check on the need for lime I decided to run a trial strip, using lime in addition to the phosphate and potash.

Trial plots were laid out on this field, and fertilizer and lime treatments were worked into the soil in advance of seeding. Forty-five per cent superphosphate was used at the rate of 200 lbs. per acre, muriate of potash at the rate of about 200 lbs. per acre, and on one plot lime, in addition to the phosphate and potash, was applied. One plot received phosphate only.

Harvests were made of the alfalfa in 1929, 1930, and 1931. Two cuttings were taken each year. The story of what the fertilizer did is told in Table II below.

(*Turn to page* 27)

TABLE I—Soil proved to be low in available phosphorus and potash.

	Total Nitrogen	Total Phos.	Avail. Phos.	Total Potassium	Acidity
Surface soil	2,260 lbs.	1,000 lbs.	30 lbs.	16,640 lbs.	Slight plus
Subsoil	1,740 lbs.	740 lbs.	12 lbs.		Slight

TABLE II—The increase from phosphate plus potash was nearly four times the gain from phosphate only.

Total yield for three years for the plot receiving phosphate and potash was	15,845 lbs. per acre.
The plot receiving the two tons of lime in addition to the phosphate and potash gave a calculated total yield of	16,350 lbs. per acre.
The plot receiving phosphate only yielded	9,909 lbs. per acre.
The check plot, adjacent, yielded only	8,103 lbs. per acre.

Picayune — An Inspiration

By E. B. Ferris

Vicksburg, Mississippi

AT a time when business conditions were so bad over the country as a whole, it was refreshing to go to Pearl River county, Mississippi, and particularly to Picayune, and see the agricultural activities that have been developing for several years and are now going on. The writer first saw the place called Picayune when it was typical of the meaning of the word, a small coin of little value. At the time, it was merely a wide place in a log road with a small railroad station and a single store the only evidences of what is now a thriving small city of some 5,000 inhabitants, with miles of paved streets and buildings that would do credit to any city several times its size. Lumber made the place, but unlike most towns of its kind, its leaders determined that it should not degenerate with the exhaustion of the pine forests.

The town and county were fortunate in having leaders who did not depend upon side capital and labor to come in and develop the lands left by the sawmills. Knowing the possibilities of the soils and seeing the developments in other sections similarly blessed naturally, they set to work to develop the lands agriculturally. In some respects these leaders faced conditions that differ from those which confronted the large sawmill operators of the past in that there were no more pine forests to conquer or rather to keep their capital active. However, too much credit cannot be given the capitalists who owned this timber since they appear to have felt it their patriotic duty to leave as much potential wealth in the county as they found on coming to it.

With this evidently in mind, these capitalists set about to find means of converting these once timbered lands into dairy farms, orchards, and plantings of other trees that may bring more wealth into the country annually than nature brought in the hundreds of years required to produce the long-leaf pine forests, granting they were the finest the world has ever seen. To this end they spared no expense in finding the crops that

(*Turn to page* 30)

Top-dressing, with fertilizer, strawberries in the world's largest strawberry patch, belonging to L. O. Crosby, Picayune, Mississippi.

Siebert Amsler and Robert Brandenburg demonstrating the pot tests for detecting soil plant-food deficiencies. In order to confirm the results, they also made tests on the plant tissues for nitrates, phosphates, and potash.

It Pays to Know

By Siebert Amsler and Robert Brandenburg

I AM Robert Brandenburg and this is my team-mate Siebert Amsler. We comprise the demonstration team from the Rensselaer High School of Jasper county, Indiana, and will demonstrate, for your approval, a simple way to detect soil deficiencies and the plant-tissue test for nitrogen, phosphorus, and potash in corn plants which we have grown in pot tests on soil from our own farm, as a part of our study in Vocational Agriculture.

The plant-tissue tests were recently developed and published by the Purdue Agricultural Experiment Station and given to the farmers of Indiana to assist them in "letting the corn plant tell the soil fertility story." By using these plant-tissue tests, very good results are obtained. It is economical and profitable for every farmer to follow a sound soils program, which includes using the proper amounts of fertilizer, lime if needed, legumes, and a good crop rotation.

We are greatly interested in these tests because we expect to follow up these pot tests on corn plants in our corn fields to see whether our corn is getting enough of the right kind of plant food from our soil.

We have planned to run some fertilizer plots with corn, leaving several rows unfertilized for check plots and then comparing these with the various fertilizer treatments. We will use these very same plant-tissue tests on the corn plants from these field plots

and see if the plants are getting enough of the three plant-food elements, nitrogen, phosphorus, and potash. By using these plant-tissue tests on the plants from these pot experiments, we have been able to determine what plant foods our soil needs for corn. We are guided by this information in laying out our field fertility plots.

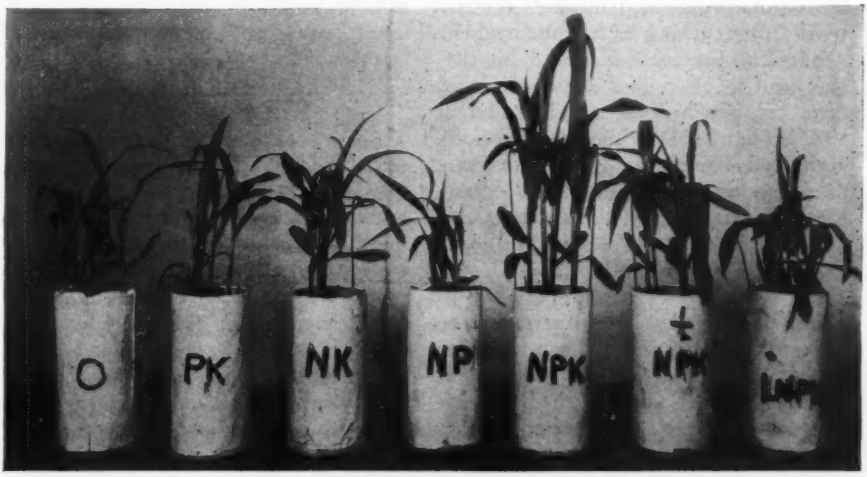
Each of us brought in about three gallons of dirt from a representative part of the field where we will grow corn. After drying the soil, we filled each of these cans with two pounds of soil. Then we thoroughly mixed different fertilizer materials with the soil in these pots.

To the first can we did not add any fertilizer, marking it 0, meaning no treatment. (Second boy holds up cans as mentioned.) To the second can we applied ¼ teaspoonful of ammonium sulfate and ½ teaspoonful of muriate of potash and mixed it thoroughly, marking it NK. To the third can we added one teaspoonful of 20 per cent superphosphate and ½ teaspoonful of muriate of potash, marking it PK. To the fourth can we added ¼ teaspoonful of ammonium sulfate and one teaspoonful of superphosphate, marking it NP. To the fifth can we added ammonium sulfate, superphosphate, and potash at the same rate as before, marking this can NPK. To the sixth can we added two teaspoonfuls of hydrated lime and the same amount of nitrogen, phosphate, and potash fertilizer materials as before, marking this can LNPK.

My team-mate, Siebert Amsler, will now show you the results of these various pot treatments and also the plant-tissue tests.

Amsler—I would like to call your attention to the fact that the best part of these tests is to note the differences in the height of the plants and leaf color symptoms. My team-mate will now show you the can marked NPK, to which all three fertilizer materials were added. I have here the can to which only phosphorus and potash were added. It is marked PK. You will observe here the effect of nitrogen starvation on the plants in this can. These plants are reddish about the base of their stems and the leaf is a paler yellow-green color than the leaves in the can having the nitrogen. This yellow-green color is characteristic of plants needing nitrogen. It is necessary to make the tissue tests for nitrate-nitrogen in order to be sure of

(*Turn to page* 28)



The need for potash was shown by the greatly stunted plants in the NP pot; phosphorus by the plants in the NK pot; and nitrogen by the plants in the PK pot, when all three of these pots are compared with the check pot receiving NPK.

The Inquiring Mind *and the* Seeing Eye

By Dr. A. S. Alexander

University of Wisconsin

SOME years ago I asked a small boy who it was that gave his elder brother the idea for an invention he had patented, and he answered: "Himself. He just thinked, and thinked, and thinked 'til it came to him."

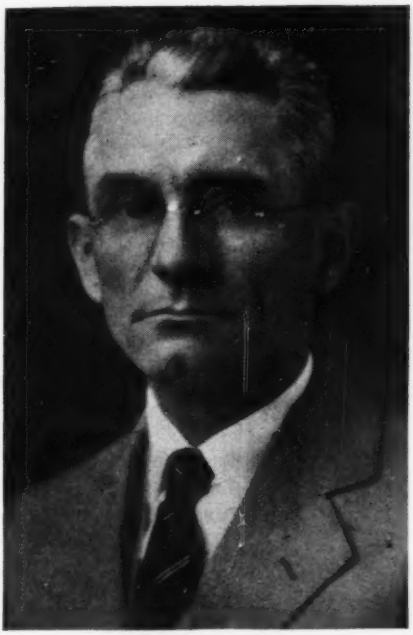
That is exactly the way in which M. J. Funchess, Dean of the School of Agriculture and Director of the Agricultural Experiment Station of the Alabama Polytechnic Institute at Auburn, has originated the unique plans and projects by which he has brought his institution into the limelight, and achieved notable success in helping the farmers of his State to better their methods of crop growing and improve their social welfare. He is a profound thinker and searcher for the truth in everything he has undertaken. "Facts for Farmers" has been his slogan, and so exact and authentic have been his conclusions and his advice, that he has become known, affectionately and admiringly, as "Facts Funchess" to his students and to the thousands of farmers who have sought and benefited by his wise counsel and leadership.

To him the ability to think, and to think to a purpose, is an attribute of supreme importance. That estimate he has inculcated upon his students as one of the chief aims which should inspire them to seek a higher education. He urges them to think for themselves and believes that the type of student who complains because the instructor is not doing for him a certain amount of thinking he should do himself will never be of much value to his community or his State. Such men, he finds, usually handle commonplace jobs and are being directed by someone who has learned to think. It is little wonder, then, that Director Funchess has gathered around him a staff of research men each of whom has individuality and is a thinker rather than a supine "yes man" who is content to carry into effect another's ideas and never originates new ones that may aid in the successful culmination of an experiment or extended research investigation. He has the ability to work *with* his staff and to inspire in them the unselfishness, enthusiasm, and enterprise which brings out the maximum capacity of each for helpful team-work.

Service Comes First

As a teacher, Director Funchess has never held out the prospect of monetary gain as the chief inducement for higher education, although he recognizes the value of increased earning capacity in the graduate student. Always, he has held and advised that State institutions can render their most important service by training men for leading positions in all lines of endeavor, with the idea that the ultimate effect of the work of a well-trained group of public officials will make the State a more prosperous economic unit and raise the level of average intelligence to a point that is

reasonably satisfying to the people. He rightly regards the purely selfish viewpoint that concerns only increased earning capacity as too narrow to justify the expense of a State-supported college or university. He thinks it highly important that practical as well as scientific facts should evolve, and is not prone to express his views upon the basis of experimentation alone, but prefers to state the facts ascertained. P. O. Davis, executive secretary of the Alabama Polytechnic Institute, believes that Director Funchess' favorite passage of Scripture is, "Know the truth and the truth shall make you free."



Dean M. J. Funchess

As to the experimental work of his Station, Director Funchess is keenly interested in the various phases of technical research, and he expects the technical and practical phases to be so coordinated that the results obtained may be of practical value to the farmers of the State. In that worthy purpose he has been eminently successful, as evidenced by the widespread improvements which have been made in the farming industry of Alabama, and it would be difficult to find elsewhere more efficient, unselfish, and patriotic research men than those who now are working with him, rather than under him.

Marion Jacob Funchess was born April 9, 1884, in Orangeburg, South Carolina, the son of Jacob S. Funchess and Ella Mariah Andrews, who represented long-established and reputable families of that Southern State. He was reared on a farm and educated in the local schools, where early he decided that a higher education would be well worth while. He entered Clemson College of South Carolina on leaving the district school, and in 1908 graduated with the degree of Bachelor of Science. In 1909 he was appointed assistant professor of agriculture at the Alabama Polytechnic Institute, and soon decided that further education in some leading institution outside of the Southern environment would round out his scientific and practical knowledge of agricultural subjects. He became a graduate student of the College of Agriculture of the University of Wisconsin, where he majored in agronomy under the guidance of Professor Ransom A. Moore. In 1911 when he was given the degree of Master of Science by the University of Wisconsin, Professor Moore said of him, "Young Funchess will be sure to make his mark, as he is earnest, honest, and thorough in his work and possessed of good executive ability." Professor A. R. Whitson of the same institution, under whom he studied soil science, was equally impressed with his industry and ability and took pleasure in helping him in his work.

On returning to Alabama he married Agnes Eloise McCants, a native of South Carolina, who was educated in Columbia College of that State and is an active worker in the Methodist church, of which her husband is also a member. They have four fine children—a son and three daughters.

Resuming his work as assistant pro-

fessor of agronomy at the Polytechnic Institute, he was made associate professor in 1912 and full professor in 1915. In 1921 he became Head of the Division of Agronomy, which position he filled until 1924; then he was appointed Dean of the College of Agriculture and Director of the Experiment Station. Since he assumed his official position and has been kept more than ordinarily busy, he has managed to find time for active service as a member of the Rotary International of Auburn, the American Society of Agronomy, the American Association for the Advancement of Science, and the Alabama Educational Association. He is also a member of Alpha Gamma Rho, Phi Kappa Phi, and Gamma Delta fraternities, and is a York Rite Mason.

Achieves His Purpose

As one can see from a glance at his portrait, "Facts" Funchess is a most emphatic fellow. When he has thought a project to a definite conclusion, that settles it; and he goes ahead with it against all obstacles, until his purpose is achieved. And he has a man's job before him in Alabama, which has been a "one-crop State," cotton being the staple and standard product. The growers of that most useful commodity have considered themselves by inheritance and experience past masters of the art of its production, and today are loath to believe or understand that their methods may not be perfect and that it would be possible to improve the quality of cotton besides increasing its per acre yield. The land long devoted to the crop naturally has been depleted in fertility, nitrogen being chiefly deficient, and it has been the aim and effort of Director Funchess and his able assistants to prescribe properly compounded fertilizer mixtures to supply the lacking elements and improve and enhance the product in a profitable manner. The growing of legume crops has been energetically urged, with satisfactory results, as a means of nitrogen supply, large areas having been devoted to the planting of hairy vetch and Austrian winter peas.

During the autumn of 1932, it is said, more seed of those legumes was planted in Alabama than in all of the other States of the Union combined. This year (1933) Alabama farmers have purchased for planting approximately 60 per cent of the available world supply of hairy vetch and Austrian pea seed, the reason being that research work done at the Experiment Station has proved the value of these legumes as nitrogen suppliers for soil improvement.

In addition to the main Experiment Station at Auburn, which has been greatly expanded and improved and its scope of work enlarged, five substations and ten experimental fields have been established under the leadership of Director Funchess, giving Alabama one of the broadest and most complete research systems in the country.

Research in Soil Fertility

When Professor Funchess went to Auburn, his time was entirely devoted to teaching; yet he was intensely interested in research work, so that he planned and started the Cullars' Rotation experiment in 1911. It is one of the three oldest experiments in the Southern States, and has as its purpose the study of the effect of phosphorus on the yield of important Alabama crops. It includes a comparison of superphosphate and rock phosphate as a source of phosphorus in the cropping system with winter legumes, together with a study of the effect of legumes in the cropping system. The purpose and progress of the experiment are well set forth in Bulletin No. 232 of the Experiment Station. Simliar work has been done and is in progress regarding the other essential fertilizing elements including potash, which is much needed in Alabama, and lime which has given fine results on many of the acid soils of the State.

While Alabama may still be called

(*Turn to page* 26)

Pictorial

COME ON! LET'S GO!

When ducks head South, it's high time for corn to be in the shock.

Sunny climes call feathered travelers away from snowy fields and cold winds.

Above: Traps are being oiled to garner the muskrat crop, no mean source of income to American agriculture.

Left: Not old enough to join in the season's sport, these eager pups are being consoled by their youthful owner.

The Editors Talk

The Present Need for Fertilizers

With very low crop prices and money or credit hard to get, if either can be got at all, many farmers have had to use much less fertilizer on their crops than in recent years. Consequently fertilizer consumption has dropped off to 50 per cent of a normal usage. But as Dr. H. G. Knight, writing in the "Scientific Monthly" on "Research in the Bureau of Chemistry and Soils" points out, consumption of other standard products, such as steel, has dropped 80 per cent. Confronted with a difficult problem, the farmer, the industry that serves him, and his advisers have done well to maintain consumption at its present level.

Another fertilizer season will soon be here. The problem of the amounts and kinds to use will have to be faced all over again, and it will probably be a hard problem for the majority of farmers. Many undoubtedly will do their utmost to use sufficient amounts of the best fertilizers for their crops. But others may be more or less satisfied to let well enough alone and use little fertilizer, if any at all.

The danger of this attitude is pointed out by Professor R. M. Salter in a recent issue of the "Ohio Farmer." He reports that in the fall of 1932 farmers used about half as much fertilizer on wheat as they averaged for the five years preceding 1930. Fortunately the following season was very good for a wheat crop. The result was that Ohio farmers obtained better than an average crop, even though it had received less fertilizer than any crop in the last 20 years. The writer points out that if farmers continue to trust to a good season, rather than to fertilizers, statistically the odds are against them, for seldom is an unusually favorable season followed by another equally as good. The author recommends wherever possible a reasonable increase in the fertilizer used on wheat.

The same might be said about a number of crops for spring planting. Signs of nutritional deficiencies have been noted in tobacco and corn fields. Cotton rust has been prevalent in the South. The maintenance of national soil fertility is approaching a critical stage.

A fertile soil is an asset at all times—good or bad. The most effective means of conserving this asset is to maintain present fertility while it is possible to do so at a reasonable cost in land management. If fertility is allowed to run too low, a profitable agriculture may no longer be possible on such land. This point is brought out by Dr. Knight in the article already referred to:

"While it is possible for the farmer for a brief period of time to reduce the scale of fertilizer application as an economy measure, this can be continued only for a short period before the fertility of the soil has been so reduced that profitable agriculture is no longer possible. It is the more essential that fertilizer use be continued if agriculture is to be lifted out of its present depression. It has been abundantly shown by scientific experimentation with fertilizers that through their use the cost of production can be materially reduced."

The maintenance of soil fertility, the lowest cost of production per unit, and the production of quality crops that can successfully compete in domestic and world markets all demand the proper use of sufficient fertilizer. It is hoped that this need will be recognized and that everybody concerned will help the farmer to count on using a reasonable amount of fertilizer for his future crop production.

New Test for Fertilizers

It is highly important in many cases to know the effect of a fertilizer mixture on the soil reaction. Realizing this need Dr. W. H. Pierre, agronomist of the West Virginia Agricultural Experiment Station, has recently developed a method.

The method consists of burning off all organic matter—the animal or vegetable matter—in the sample of fertilizer being tested, and then determining the amount of acid-forming and alkali-forming elements left in the sample. Thus can be told what the fertilizer will do to the soil besides enriching it with nitrogen, phosphorus, and potash.

"Mr. Pierre has made a real contribution to soil science," says Emil Truog of the Soils Staff of the University of Wisconsin, as reported in the Press Bulletin of that University. "The method should tend to encourage manufacturers to make fertilizers better suited to farm needs. In the past, there has been no ready method for determining the value of fertilizers in this manner."

As noted by Dr. Pierre, in common with other soils workers, no recognition is now given, either by State control officials or by most fertilizer manufacturers, to the influence which mixed fertilizers have on soil reaction. He believes that because the acid or alkali action of any mixed fertilizer is one of the most important properties of a fertilizer, it should be recognized as such and that there should be State control laws governing the sale of the product.

Undoubtedly this is an important subject meriting serious consideration on the part both of fertilizer manufacturers and experiment station workers.

New Service of the U.S.D.A.

The Bureau of Agricultural Economics of the United States Department of Agriculture is now publishing farm prices every week. For some years the Bureau has estimated and published every month the prices farmers receive for important farm products and the prices they pay for what they buy. The weekly service is an aid in developing and carrying out the administration's program for agriculture and meeting the vital interest of the whole nation in the improvement of the position of agriculture among our industries.

An example of the information given in these weekly bulletins and of the variation in the farmer's position from week to week may be noted in the following: The index of the prices of farm products on October 11 was 69 compared with 71 on October 4, and of prices paid by farmers for commodities bought 116.5 on October 11 compared to 117 on October 4. This put the exchange value of farm products for commodities farmers buy at 59 on October 11, compared with 61 on October 4.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Fertilizers, Soils, Crops, and Economics. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Tomato growers will be interested in the carefully conducted experiments reported by M. M. Parker in Virginia Truck Experiment Station Bulletin 80, "Tomato Fertilization." Various fertilizer analyses covering a range of 0 to 6 per cent ammonia, 0 to 10 per cent phosphoric acid, and 0 to 12 per cent potash were used. Several tests were run over a period of years and from the data it is concluded that 1,000 pounds of 4-10-6 fertilizer is the best for average conditions in the Tidewater section of Virginia. Where the soil is very fertile, 2-10-6 may be substituted for 4-10-6. Where any of the three elements were omitted from the fertilizer, there was a decided drop in yield, showing that a complete fertilizer is needed. Manure when available gave very good results when used in conjunction with liberal amounts (500 to 1,000 pounds) per acre of complete fertilizer.

"Study of Rice Fertilization," Agr. Exp. Sta., Fayetteville, Ark., Bul. 291, June, 1933, L. C. Kapp.

"Quarterly Bulletin, Fertilizer and Seed Report," State Bd. of Agr., Dover, Del., Vol. 23, No. 2, Jan.-June, 1933.

"Commercial Fertilizers," Agr. Exp. Sta., Lafayette, Ind., Cir. 196, May, 1933, H. R. Kraybill.

"The Use of Cyanamid as a Source of Nitrogen for Sugar Cane in Louisiana," Agr. Exp. Sta., Baton Rouge, La., La. Bul 237, June, 1933, A. K. Smith, Jr.

"Experiments with Phosphate Fertilizers on Montana Soils," Agr. Exp. Sta., Bozeman, Mont., Bul. 280, July, 1933, Edmund Burke, Iver J. Nygard, and William McK. Martin.

"Fertilizers and Manure for Corn," Agr. Exp. Sta., Knoxville, Tenn., Bul. 149, June, 1933, C. A. Mooers.

"Fixation and Penetration of Phosphates in Vermont Soils," Agr. Exp. Sta., Burlington, Vt., Bul. 356, June, 1933, V. L. Weiser.

"The Composition and Distribution of Phosphate Rock with Special Reference to the United States," U. S. Dept. of Agr., Washington, D. C., Tech. Bul. 364, June, 1933, K. D. Jacob, W. L. Hill, H. L. Marshall, and D. S. Reynolds.

Soils

Among farmers one frequently hears the "old-timers" remark that "we don't get the yields around here that we used to." The cause is laid to a number of things such as more disease, more crop pests, different seed, different weather and seasons, different types of farming, and less fertile soil than formerly. All of these are probably influential to some extent in causing lower yields, but depleted soil fertility is possibly the most important. The extent to which the fertility of a soil may be depleted when unfertilized is shown in a recent publication by H. Jenny ("Soil Fertility Losses Under Missouri Conditions," Missouri Agricultural Experiment Station Bulletin 324). He was able to study two continuous fields, one of which has been continuously cultivated for 60 years, while the other is a virgin prairie and has been in grass continuously, with pasturage and some hay the only crop removal from it. The typography of the fields was such that there was very little erosion, so that plant-food

loss occurred only through cropping and leaching. No fertilizer or manure has ever been used on these fields. Analysis of the soils showed that the cropped field contained about one-third less nitrogen, organic matter, and exchangeable bases (available potash, lime, and magnesia) than the virgin field. Other properties of the cropped field also were less favorable than those of the virgin field. The author points out that rebuilding this soil will be costly. The logical conclusion may be drawn that it is much better economy to maintain the fertility of the soil by means of fertilizers, crop rotation, and manure or green manure, than to deplete the soil and then try to rebuild it.

The primary importance of cover crops in the productivity of an apple orchard is stressed by F. N. Fagan, R. D. Anthony, and W. S. Clarke, Jr. in Pennsylvania Agricultural Experiment Station Bulletin 294 entitled, "Twenty-five Years of Orchard Soil Fertility Experiments." Basing their conclusions on this long-time orchard fertility experiment, the investigators believe that the efficient management of the fertility of the orchard is dependent upon maintaining or increasing the organic matter content of the soil. Fertilization of the orchard is thus more a matter of fertilizing to obtain a good cover crop than directly fertilizing the tree. The use of complete fertilizer greatly increased the yield of cover crops on the orchard and this was reflected in increased tree growth and yields. A favorable fertilizer treatment shows first in increased cover crop growth. Later, leaf color is improved, followed by increased branch growth and circumference, and finally, increased yields result. For the complete effect of the fertilizer to be obtained, several years may be necessary. The authors also give interesting and valuable results of using various cover-crop systems in the orchard. Tree fruit growers will find this publication contains much practical information on the soil management of the orchard.

"Soil Fertility Studies," Agr. Exp. Sta., Fayetteville, Ark., Bul. 290, June, 1933, Martin Nelson.

"The Classification and Evaluation of the Soils of Western San Diego County," Agr. Exp. Sta., Berkeley, Cal., Bul. 552, June, 1933, R. Earl Storie.

"Ford County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Rept. No. 54, Apr., 1933, R. S. Smith, E. E. DeTurk, F. C. Bauer, and L. H. Smith.

"Jackson County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Rept. No. 55, June, 1933, E. A. Norton, R. S. Smith, E. E. DeTurk, F. C. Bauer, and L. H. Smith.

"Soil Management and Fertilizers for Indiana Fruit Crops," Agr Exp. Sta., Lafayette, Ind., Ext. Leaflet 185, June, 1933, Monroe McCown.

"Effects of Inoculation and Liming on Alfalfa Grown on the Grundy Silt Loam," Agr. Exp. Sta., Ames, Iowa, Bul. 305, June, 1933, R. H. Walker and P. E. Brown.

"Soil Survey of Iowa—Pocahontas County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Rept. No. 69, June, 1933, P. E. Brown, A. M. O'Neal, and H. R. Meldrum.

"Soil Survey of Iowa—Butler County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Rept. No. 70, June, 1933, P. E. Brown, J. A. Elwell, H. R. Meldrum, and R. E. Bennett.

"Soil Survey of Iowa—Sac County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Rept. No. 71, June, 1933, P. E. Brown, C. L. Orrben, H. R. Meldrum, and R. E. Bennett.

"Soil Survey of Iowa—Calhoun County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Rept. No. 72, June, 1933, P. E. Brown, T. H. Benton, W. J. Leighty, and H. R. Meldrum.

"Agricultural Land Classification and Land Types of Michigan," Agr. Exp. Sta., East Lansing, Mich., Spec. Bul. 231, Apr., 1933, J. O. Veatch.

"Proceedings of the First Missouri Conference on Land Utilization, University of Missouri College of Agriculture, February 23 and 24, 1933," Agr. Exp. Sta., Columbia, Mo., Bul. 323, Apr., 1933.

"Dry Land Crop Production at the North Platte Experimental Substation," Agr. Exp. Sta., Lincoln, Neb., Bul. 279, Feb., 1933, L. L. Zook.

"The Effects of Acidifying Amendments on Impermeable Soils," Agr. Exp. Sta., State Col., N. M., Bul. 210 (Tech.), May, 1933, C. W. Botkin.

"Relations Between Orchard Soils and Cover Crops," Agr. Exp. Sta., Geneva, N. Y., Bul. 632, July, 1933, R. C. Collison.

"Soil Inoculant Service," Agr. Exp. Sta., Geneva, N. Y., Cir. 137, Mar. 1, 1933, H. J. Conn and A. W. Hofer.

"Maintaining Fertility of Grande Ronde

Valley Soils," Agr. Exp. Sta., Corvallis, Ore., Sta. Bul. 311, Mar., 1933, W. L. Powers and D. E. Richards.

"Grades of Peat and Muck for Soil Improvement," U. S. Dept. of Agr., Washington, D. C., Cir. 290, Aug., 1933, A. P. Dachnowski-Stokes.

"Soil Survey of The Oceanside Area, California," U. S. Dept. of Agr., Washington, D. C., Series 1929, No. 11, R. Earl Storie and E. J. Carpenter.

"Soil Survey of Hart County, Georgia," U. S. Dept. of Agr., Washington, D. C., Series 1929, No. 12, G. L. Fuller.

"Soil Survey of Worth County, Georgia, U. S. Dept. of Agr., Washington, D. C., Series 1929, No. 13, Robert Wildermuth, S. W. Phillips, J. A. Kerr, A. L. Gray, and W. D. Lee.

"Soil Survey of Hancock County, Mississippi," U. S. Dept. of Agr., Washington, D. C., Series 1930, No. 4, Clarence Lounsbury, E. B. Deeter, S. R. Bacon, and J. T. Miller.

"Soil Survey of The Basin Area, Wyoming," U. S. Dept. of Agr., Washington, D. C., Series 1928, No. 27, James Thorp, E. G. Fitzpatrick, T. J. Dunnewald, and F. T. Gorsuch.

Crops

The "Report on the Agricultural Experiment Stations, 1932," prepared by the Office of Experiment Stations and issued by the United States Department of Agriculture, brings up to date information on the practical benefits of recent experiment station work. The authors, J. T. Jardine and W. H. Beal, present in interesting short paragraphs results of experimental work under headings of such varied interest as, "Increasing the Efficiency of Crop Production," "Protection Against Insect Pests and Plant Diseases," "Feeding, Breeding, and Management," "Improvement in Farm Structures and Equipment," Waste Products and By-products," "Improving Marketing," "Cooking Quality and Palatability of Foods," "Housing and Home Conveniences," and many others. The publication is a concise confirmation of the tremendous role experimental and research work plays in the improvement of our agriculture.

"Pruning and Training Tomatoes in Arkansas," Agr. Exp. Sta., Fayetteville, Ark., Bul. 292, June, 1933, Victor M. Watts.

"Genetic Relations of Red Plant Color, Leaf Shape, and Fiber Colors in Upland Cotton," Agr. Exp. Sta., Fayetteville, Ark., Bul. 294, June, 1933, J. O. Ware.

"Monthly Bulletin of the Department of Agriculture," Dept. of Agr., Sacramento, Calif., Vol. XXII, No. 6, June, 1933.

"Chemical Investigations of the Tobacco Plant—IV. The Effect of the Curing Process on the Organic Acids of Tobacco Leaves," Agr. Exp. Sta., New Haven, Conn., Bul. 352, June, 1933, Hubert Bradford Vickery and George W. Pucher.

"Changes in Composition of Florida Avocados in Relation to Maturity," Agr. Exp. Sta., Gainesville, Fla., Bul. 259 (Tech.) May, 1933, Arthur L. Stahl.

"1932 Report Cooperative Extension Work in Agriculture and Home Economics," Univ. of Fla., Gainesville, Fla., Wilmon Newell.

"Work and Progress of the Agricultural Experiment Station for the Year Ending December 31, 1932," Agr. Exp. Sta., Moscow, Idaho, Bul. 197, May, 1933.

"Onion Culture," Agr. Exp. Sta., Urbana, Ill., Cir. 410, June, 1933, J. W. Lloyd.

"Asparagus," Agr. Exp. Sta., Lafayette, Ind., Ext. Leaflet 176, May, 1933.

"Profits in Tomato Picking," Agr. Exp. Sta., Lafayette, Ind., Ext. Leaflet 181, May, 1933.

"Growing Tomatoes For the Early Market," Agr. Exp. Sta., Lafayette, Ind., Ext. Leaflet 182, June, 1933.

"Snap Beans For the Canner," Agr. Exp. Sta., Lafayette, Ind., Ext. Leaflet 183, May, 1933.

"Report of Moses Annex Farm, Bedford, Indiana," Agr. Exp. Sta., Lafayette, Ind., Cir. 187, June, 1933, H. J. Reed and H. G. Hall.

"Marketing Indiana Sweet Potatoes," Agr. Exp. Sta., Lafayette, Ind., Bul. 370, Jan., 1933, Fay C. Gaylord and Harry M. Cleaver.

"Factors Affecting Experimental Error in Field Plot Tests With Corn," Agr. Exp. Sta., Ames, Iowa, Res. Bul. 163, June, 1933, Arthur A. Bryan.

"The Relation of Moisture to Respiration and Heating in Stored Oats," Agr. Exp. Sta., Ames, Iowa, Res. Bul. 165, June, 1933, A. L. Bakke and N. L. Noecker.

"The Effect of Certain Cropping Systems on the Yield and Quality of Havana Tobacco," Agr. Exp. Sta., Amherst, Mass., Bul. 297, June, 1933, A. B. Beaumont, M. E. Snell, and E. B. Holland.

"Sudan Grass as an Emergency Pasture on Light Soil," Agr. Exp. Sta., East Lansing, Mich., Spec. Bul. 240, July, 1933, A. B. Dorrance.

"The Quarterly Bulletin," Agr. Exp. Sta., East Lansing, Mich., Vol. 16, No. 1, Aug., 1933.

"Grape Growing in Minnesota," Agr. Exp. Sta., Univ. Farm, St. Paul, Minn., Bul. 297, Mar., 1933, W. G. Brierley and W. H. Alderman.

"Better Methods for Growing Alfalfa," Agr. Exp. Sta., Columbia, Mo., Bul. 326, July, 1933, W. C. Etheridge and C. A. Helm.

"A Comparison of Irrigated and Non-irrigated Seed Potatoes," Agr. Exp. Sta., Bozeman, Mont., Bul. 279, May, 1933, F. M. Harrington.

"Annual Legumes For Cheap Milk," Univ. of N. H., Durham, N. H., Press Bul. 168, Feb., 1933, Ford S. Prince.

"Establishing a Strawberry Planting," Agr. Exp. Sta., New Brunswick, N. J., Cir. 281, Apr., 1933, J. Harold Clark.

"China Asters," Agr. Exp. Sta., New Brunswick, N. J., Cir. 289, June, 1933, C. H. Connors.

"Orchard Management with Notes on Varieties," Agr. Exp. Sta., State Col., N. M., Bul. 209, May, 1933, A. B. Fite.

"Chemical Compositions of New Mexico Pinto and Bayo Beans," Agr. Exp. Sta., State Col., N. M., Bul. 213, June, 1933, Mary L. Greenwood.

"Freezing Injury to the Roots and Crowns of Apple Trees," Agr. Exp. Sta., Ithaca, N. Y., Bul. 556, Apr, 1933, H. E. Thomas and L. H. MacDaniels.

"Lettuce Production on the Muck Soils of New York," Agr. Exp. Sta., Ithaca, N. Y., Bul. 564, June, 1933, J. E. Knott.

"The Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Ohio, Vol. XVIII, No. 164, Sep.-Oct., 1933.

"The Pennsylvania Agricultural Experiment Station 46th Annual Report," Agr. Exp. Sta., State Col., Pa., Bul. 293, July, 1933.

"Winter Cover Crop Experiments at the Pee Dee Experiment Station," Agr. Exp. Sta., Clemson Col., S. C., Cir. 51, Sep., 1933, E. E. Hall, W. B. Albert, and S. J. Watson.

"Winter Wheat Production in South Dakota," Agr. Exp. Sta., Brookings, S. D., Bul. 276, Mar., 1933, K. H. W. Klages.

"Hardy Flowers, Shrubs, Trees, and Vines for Washington Homes," Agr. Exp. Sta., Pullman, Wash., Ext. Bul. 181, June, 1933, J. Raymond Herman.

"Roots for the Dairy Cow," Agr. Exp. Sta., Morgantown, W. Va., Bul. 256, June, 1933, H. O. Henderson and K. S. Morrow.

"Grasses, Alfalfa, and Sweet Clover at the Archer Field Station," Agr. Exp. Sta., Laramie, Wyo., Bul. 195, Mar., 1933, A. L. Nelson.

"Currants and Gooseberries—Their Culture and Relation to White-Pine Blister Rust," U. S. Dept. of Agr., Washington, D. C., Farmers' Bul. 1398 (Rev.) Jan., 1933, George M. Darrow and S. B. Detwiler.

"Planting and Care of Lawns," U. S. Dept. of Agr., Washington, D. C., Farmers' Bul. 1677, (Rev.) Apr., 1933, H. L. Westover and C. R. Enlow.

"Agricultural Investigations at the Huntley (Mont.) Field Station, 1927-1930," U. S. Dept. of Agr., Washington, D. C., Tech. Bul. 353, May, 1933, Dan Hansen, A. E. Seamans, and D. V. Kopland.

"Root Development of Cotton Plants in the San Joaquin Valley of California," U. S. Dept. of Agr., Washington, D. C., Cir. 262, Mar., 1933, J. W. Hubbard and Fred W. Herbert.

"The Use of Winter Legumes in the Southeastern States," U. S. Dept. of Agr., Washington, D. C., Tech. Bul. 367, June, 1933, A. D. McNair and Roland McKee.

Economics

A graphic picture of the advancement in agriculture during the last two decades is to be found in a new Ohio Bulletin No. 526, "Twenty Years of Ohio Agriculture, 1910-1930." While the changes are confined to this one commonwealth, the reader of this bulletin will sense applicability to other sections and find most interesting information on a period in American agriculture of which the author, Dr. J. I. Falconer, Chief of the Department of Economics, says: "Probably no period has seen a greater advance in the facilities for farm life than that from 1910 to 1929." The bulletin is one which should find a prominent place in the library of anyone interested in the history of our greatest industry.

"The Human Factor in the Management of Indiana Farms," Agr. Exp. Sta., Lafayette, Ind., Bul. 369, Aug., 1932, Walter W. Wilcox and O. G. Lloyd.

"Annual Fluctuations in the Price of Corn," Agr. Exp. Sta., Ames, Iowa, Res. Bul. 164, June, 1933, Geoffrey Shepherd.

"Prices on Farm Products in Maine," Agr. Exp. Sta., Orono, Me., Bul. 364, Mar., 1933, Charles H. Merchant.

"Trends in Cherry Production in Michigan," Agr. Exp. Sta., East Lansing, Mich., Spec. Bul. 237, June, 1933, G. N. Motts, C. A. Scholl, and J. W. Chapin.

"Farm Organization as Affected by Mechanization," Agr. Exp. Sta., Bozeman, Mont., Bul. 278, May, 1933, E. A. Starch.

"Efficiency Studies in Dairy Farming," Agr. Exp. Sta., Durham, N. H., Bul. 275, May, 1933, H. C. Woodworth, C. W. Harris, Jr., and Emil Rauchenstein.

"Taxation of Agriculture in North Carolina," Agr. Exp. Sta., State Col. Sta., Raleigh, N. C., Tech. Bul. 43, June, 1933, G. W. Forster and Marc C. Leager.

"An Economic Study of the Cherry Industry with Special Reference to Oregon," Agr. Exp. Sta., Corvallis, Ore., Sta. Bul. 310, Feb., 1933, Milton N. Nelson and George L. Sulerud.

MISSOURI FARMERS FIND KOREAN LESPEDEZA USEFUL

(Farm science State by State—MISSOURI)

The task of changing the prevailing system of farming in a region is one in which Governments have often failed, but it frequently happens that a new plant can do this in a few years. This is what has happened in Missouri within the last 10 years, since the introduction of Korean lespedeza by the United States Department of Agriculture.

In this new system of farming Korean lespedeza promises to reduce the acreage of corn to a large extent in the regular rotations, the grains—mostly barley—being used for feed instead of corn. The system is simple; farmers sow winter grains as usual, sow the lespedeza on the grain in the spring, harvest the grain, graze the lespedeza during the summer. It reseeds itself in September in time to disc the land and plant fall grains again.

This rotation has been worked successfully over a wide area, from Missouri to North Carolina. It has found more application, however, in States where livestock feeding is a major part of the farm business. The Missouri College of Agriculture has fostered the use of Korean lespedeza in this manner for several years and has made trial plantings all over the State. Missouri farmers grew approximately a million acres this year. Other States in the corn belt are trying the plan.

The lespedeza program offers three advantages—it improves the soil where the clovers will not grow unless limed; it provides good pasture during the summer; and by doing this removes a heavy burden from permanent pastures. It fits in well with wheat, oats, or barley.

Korean is similar in many respects to common lespedeza, a native of the United States, known in many sections as Japan clover. The Korean matures seeds earlier and makes more growth. In feeding value it ranks with sweetclover, and is close to alfalfa.

LACK OF POTASH CAUSES CORN TO TURN YELLOW

LAFAYETTE, Ind., August 12.—Many spots and even whole fields of corn are at present showing a sickly appearance with the lower blades striped with yellow and green or almost entirely yellow with the edges dry and dead. This condition is quite prevalent in the dark sandy and muck soils of northern Indiana and may be found in light as well as dark colored lands in central and southern Indiana.

This condition is due to a lack of potash and will always show up when the corn plant is unable to get potash, according to S. D. Conner, of the Purdue University soils and crops department. It may be aggravated by either excessively dry or excessively wet weather. At this time it is too late to help the present crop, Conner stated, but farmers should know that it is a good time to look over their fields with the idea of correcting this condition in the future.

On soil where the corn shows this yellow condition, higher percentages of potash should be used in the fertilizer. For wheat 200 to 300 pounds per acre of 2-12-6 would be good and where the potash deficiency is very great 2-12-12 would be better. For corn 100 pounds of 0-12-12 per acre dropped in the row or near the hill will take care of mild cases of potash deficiency. Where the corn is very poor 200 pounds of muriate of potash broadcast should be used in addition to the 0-12-12.

Barnyard manure contains potash.

and five to ten-ton applications of manure will take care of the potash needs. On the Purdue farm at Lafayette on untiled land without potash or manure this condition is very bad. Near the tile lines where the corn roots deeply, it is able to get more potash from the subsoil than is the case between the tile where the roots are shallow. On this farm, potash is adding 10 to 15 bushels of corn to the acre. On very badly deficient land heavy potash fertilization has added 40 to 60 bushels of corn to the acre.

The yellowing of corn from lack of potash may be easily distinguished from the yellowing of corn due to lack of nitrogen. The potash-deficient corn shows green mid-ribs and veins with yellow strips between and on the edges. Nitrogen-deficient corn shows a yellow mid-section with greener edges. The Agronomy Department of the Purdue Experiment Station, as well as the county agricultural agents, will be glad to examine corn plants as well as soil samples and advise farmers who desire such service.

The Inquiring Mind

(*From page* 14)

a "one-crop State," it produces in addition to cotton considerable crops of corn and hay, while livestock and livestock products are also important items in the farmers' program. The actual sales or money returns to the farmer from such commodities, however, are relatively small when compared with the receipts from cotton, and Director Funchess is, therefore, insisting that a new agricultural program must be developed in the State to improve the unsatisfactory condition which exists there at present and is largely responsible for the poor conditions experienced by business men in the towns and cities.

The new program he proposes is imperatively necessary, since boll-weevil damage and bad seasons have seriously reduced crop yields and intensified the general depression. Throughout the country the commanding position of American industry is based almost entirely upon work of the industrial research laboratories, and Director Funchess sees clearly that, if agriculture is to progress, the farmers' business must be the beneficiary of a similarly enlightened plan of development. Agricultural research is, therefore, imperative; but it need not necessarily include the production of more cotton but should include research to further the production of a better quality of cotton at a lower cost. It should likewise include experimental work with dairy cattle and poultry, and the production of more corn, hay, feed crops, livestock, and livestock products. The Director is earnestly trying to bring about more diversified farming in his one-crop State. And in all of the research work proposed and being undertaken, he wisely insists that *the major object must be the production of a better product at a lower cost.*

He also is teaching that agricultural research must include the conservation and improvement of the soil and of its forests, the study of all kinds of pests and diseases of plants and animals, the introduction of new crops, and the improvement of the old ones. It is with this purpose that he looks to the people of his State for larger funds to continue and extend the research work of the Experiment Station. He is firmly convinced as he says, "It is most probable that economic salvation will come quickest by supplying the individual farmer with sufficient knowledge of his own problems to enable him to meet competition and work out his own salvation. The nearest to a permanent

solution, therefore, may be found through the establishment by research of a real workable agricultural program. Industry has pinned its faith to such a development, and agriculture cannot be developed on any other basis."

Director Funchess has written many practical as well as scientific bulletins for the instruction of Alabama farmers and to help them inaugurate and foster the new program of crop and livestock production he rightly considers vital to their success. Many others of like type and value have come from the pens of his associates as a result of their research work, and the educational campaign thus founded and conducted is already having a salutary effect.

P. O. Davis tells us that busy "Facts" Funchess finds recreation by fishing and playing golf. He has made a hole-in-one and once was fortunate enough to catch two bass on a plug, at one cast. We are glad to know that he finds time for play, for it would be a pity indeed were such a dynamic and useful executive and research worker to wear himself out, by excessive effort, before he has seen the consummation of his hopes for the betterment of the farmers and farming industry of Alabama.

We respect and commend Director Funchess for the vision and capacity he has shown in his responsible position, wish him many years of fruitful work, and feel assured he will find true that: "He most lives who thinks most, feels the noblest, and acts best."

Interest — 300%

(*From page* 8)

In other words, there was an increase of nearly four tons more alfalfa on the fertilized plots receiving both potash and phosphate, but less than a ton gain for the phosphate only. At $12 per ton, four tons of alfalfa are worth $48.

You will ask immediately, "What was the cost of the fertilizer treatment for the combination of potash and phosphate?" At the time these fertilizers were applied, 200 lbs. of 45 per cent superphosphate cost about $5; and 200 lbs. of potash were about $5. Thus, an investment of $10 per acre really netted a gain of $38, or principal returned with 380 per cent profit.

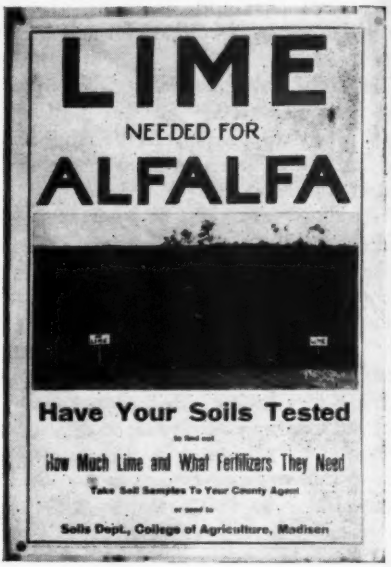
The lime treatment, it appears from the experiment, was not essential. In fact, this was indicated by the initial test for acidity. By stimulating a strong growth of alfalfa on such soils through the use of fertilizers, the alfalfa seedlings can get their roots down into the subsoil where they secure ample supplies of lime. Remember, the subsoil showed very little acidity; in fact, at two feet the subsoil contained lime.

Such demonstrations give us all renewed confidence in our recommendations. They back up our confidence in soil tests, and recommendations based on these tests. We now have a new test for available potash which promises to shed further light on the probable need for potash fertilizer. This test has been recently worked out by Professor Emil Truog and Dr. Norman Volk of the Soils Department of this University. We recently ran an available potash test on one of the check plots of this field and found that the supply was low, an average of only 152 lbs. per acre.

We are urging farmers, more than ever before, to have their soils tested in advance of seeding fields to alfalfa. "Save by testing" is our motto. Find out first if your soil needs lime. Don't waste good lime on fields that do not need it. We like to test the subsoil

as well as the surface soil. In fact, I am convinced that a test of the subsoil down to a depth of 36 inches is important. See what it revealed in the case of the soil on this field which was seeded to alfalfa—a slight acidity in the surface, but at two feet the soil was calcareous. Had Mr. Sharratt just proceeded on the assumption that alfalfa needed lime, he would have spent in the neighborhood of $4 per acre with but very little return for this lime. The test for available phosphates did show a great need for phosphate fertilization, and the test for total potassium indicated a very low total content of this element. The more recent test for available potash by our new method confirms our initial assumption that potash was needed—in fact, potash proved to be the outstanding need, although phosphates were unquestionably needed to enable the potash to be effective.

I am convinced that anything short of adequate soil preparation and proper fertilization for alfalfa is a waste of time and money. Better do what you do, and do it well, than to only half do a job and thus multiply your chances for failure.


LIME
NEEDED FOR
ALFALFA
Have Your Soils Tested
How Much Lime and What Fertilizers They Need
Take Soil Samples To Your County Agent
Soils Dept., College of Agriculture, Madison

A poster bulletin now being used in Wisconsin's great alfalfa campaign.

It Pays to Know

(*From page* 11)

this symptom because some plants starved for potash will have somewhat the same appearance. The test for nitrates will be demonstrated in a few minutes.

My team-mate will show now the can to which nitrogen, phosphorus, and potash were added, marked NPK. I will show you the can to which were added nitrogen and phosphorus only, marked NP. You will observe here the symptoms of potash starvation. The plants without potash are extremely short, with small, spindly, weak stalks and small flabby leaves. Please note that in this test these differences in height show the greatest need of this soil is for potash. The second greatest need is for phosphorus.

I now will show you the can to which were added nitrogen and potash, marked NK. Comparing this with the NPK can, you will observe that with phosphorus added the plants were able to grow larger and are heavier stalked and darker green.

In all cases the NPK pot serves as a check and the needs of the soil for nitrogen, phosphorus, or potash are distinctly observed by these differences in height and leaf color symptoms when each one of these plant foods is omitted in the other treatments.

(Each boy now proceeds to make tests on the plant tissues.)

Brandenburg—My team-mate, Amsler, will now explain how we make these tests.

Amsler—We will make first the test for nitrate nitrogen to see if the plants are getting sufficient nitrogen from the soil.

(Boys make nitrate N tests, first boy on the NPK and second boy on the PK treatment.)

I am testing the PK treatment pot, and my team-mate the NPK pot. We first take a green leaf and cut it with a pair of scissors into small pieces, letting them fall into a small dish. We then pour on a few drops of a 1 per cent solution of diphenylamine in sulfuric acid, and stir with a glass rod. A blue color indicates that the plant is getting an abundance of nitrogen, and a colorless or light green shade indicates the inability of the plant to get sufficient nitrogen from the soil. My test shows that the plants are not getting enough nitrogen from the soil, as indicated by the light yellow-green color of the solution. My team-mate's test shows the plants to which nitrogen was added to the soil. They are getting plenty of nitrogen, as the test solution shows a deep blue color.

Little Available Phosphorus

Next will be the phosphate test.

I will test part of the stem from the NP treatment pot, and my teammate a stem from the NK pot. We first take a representative plant and cut it into small pieces and place them in a vial about ¼ inch deep. Then we add enough of the phosphate test solution to fill the vial about ⅔ full. Then add two or three crystals of stannous chloride and shake vigorously. A deep blue color indicates plenty of phosphorus. (Boys hold up vials.) My test solution is a deep blue color showing that the plant is getting plenty of phosphorus from the soil. My team-mate's solution is yellowish green, showing that the plants are not getting sufficient phosphorus from the soil in the NK pot.

The results of this test show definitely that the soil supplies very little available phosphorus and in our field work it will be necessary to use phosphorus in our fertilizer.

We will now make the potash test. (Each boy begins work.) I will make my test on the NP pot and my teammate on the NK. Potash has been added to the soil in his pot while mine only contains the nitrogen and phosphate fertilizer materials.

First take a green leaf and fill the large vial with cut portions of the leaf up to the first mark, equivalent to 1 cc. Then add the potash test solution up to the second mark, 10 cc. Shake well. Add 5 cc. ethyl alcohol up to third mark and shake again. If the solution remains clear, the stunted plants are not getting sufficient potash from the soil. If the solution becomes cloudy and a precipitate forms, then the plants are getting potash from the soil. (Boys hold up vials.) My plant is not getting sufficient potash as indicated by the clear solution. My teammate's test shows that his plant is getting some potash from the soil shown by the cloudy, yellow precipitate.

Potash Most Needed

By comparing the results of this potash tissue test and observing the extremely stunted plants in the NP pot in comparison with the NPK pot, it is very evident that potash is the major deficiency in this soil for corn plants.

Please refer to and study the plants and you will observe that the following plant foods are needed: potash as shown by the greatly stunted plants in the NP pot; phosphorus by the plants in the NK pot; and nitrogen as shown by the plants in the PK pot, when all three of these pots are compared with the check pot receiving NPK. These tissue tests confirm these deficiencies in height of the plants in the various pots and also the characteristic leaf symptoms displayed by the plants.

It is not possible to make any recommendations as to definite fertilizer analysis, but the results of this test serve as a guide in selecting those analyses which may do the greatest good. In our field tests we are planning to use a large quantity of potash and superphosphate.

Are there any questions? We thank you for your kind attention.

Picayune—An Inspiration

(*From page 9*)

were adapted to soil and climate, going to far-off China for the Tung Oil tree and to sections closer home for crops that thrive and bring value to soils of like character. Strawberries are one of these crops and it was only necessary to study conditions around Hammond, Louisiana, some 75 miles away and possibly the largest strawberry center of the South, to convince these men that the crop would do equally well at Picayune. However, another country of the Far East, Japan, furnished the Satsuma orange, a crop that is fast making this Picayune territory a rival of Florida and Southern California.

The rapid development of this strawberry industry was forcefully brought to our attention recently while attending to duties in no way connected with their growth and at a place some 25 miles north of Picayune. A railroad extended this far and beyond was used to haul logs to the mills at Picayune. Trucks loaded with pine straw continued to go in one direction and to return empty. Curiosity prompted the inquiry as to what it meant. We were told that they were hauling this straw to the log road to be loaded in cars and shipped to the berry fields at Picayune for mulching the plants. This led further to a quick trip into Picayune where the agricultural agent of the Southern Railway gave the information that berries were shipped this year from 1,300 acres in the Picayune territory and that the largest single field of strawberries in the world might be seen there, this field containing 550 acres planted two rows to the bed, the equivalent of 900 acres with only one row to the bed, the most frequent way of planting. These 1,300 acres had increased from 326 acres grown the year before when 39 carloads of berries were shipped, returning about $20,000.

This great increase has been partly due to the obligation L. O. Crosby seems to have felt to provide work for his laborers at a time when it was not profitable to operate his sawmills. The labor was used at a living wage to prepare the land and set the plants.

Increase in plantings of Satsuma oranges is fast making this Picayune territory a rival of Florida and Southern California.

However, berries alone have not been the only crop, nor he the only grower who has planted them. Several years before he set a large acreage to Satsuma oranges, asparagus, and Tung Oil trees, besides developing large dairies and poultry plants in several directions from Picayune. One of these dairies has possibly the finest herd of registered Jerseys in the entire South, with a $25,000 bull at its head and cows, heifers, and other bulls that have won prizes at the leading cattle shows over the country. From these dairies certified milk was being sold in the city of New Orleans, some 45 miles to the south, delivered there daily in specially built milk trucks. As early as January 25 asparagus was being shipped and was bringing the fancy price of $5 per box. An expert had been employed to supervise the growing of these many crops and we were shown a recent circular from him telling how the growers should fertilize and mulch their berries and recommending a 4-10-7 as a commercial mixture possibly best suited to the growth and fruiting of the berries.

In this Picayune territory, Mr. Crosby's former partner in the lumber business, Lamont Rowlands, has already planted 9,600 acres to Tung Oil trees and is said to contemplate almost as large an additional acreage in the near future. From 100 acres planted to Satsuma oranges, Mr. Rowlands shipped in the fall of 1932 about 20 cars of fruit. In order to encourage the further planting of lands to Tung Oil trees, Mr. Rowlands has established a large nursery and on account of the general scarcity of ready money everywhere is offering to swap these trees for any kind of product the farmers may have—cattle, hogs, sheep, potatoes, syrup, and the like. Picayune became famous for its peaches long before it started so heavily into Tung Oil and strawberries and the Peach Harvest Festival has for several years been an annual feature.

Truly the spirit of Picayune is good for the blues and the slogan that heads the stationery of many of the local business houses, "Every moon is a harvest moon in the land of Picayune," seems peculiarly appropriate, for in addition to the crops mentioned and stressed, they grow all the common farm crops of the State along with summer and winter vegetables, pineapple pears, and pecans in quantities that would astonish the average small grower.

Cows and Codes

(*From page 6*)

conditions in the country not, as some believe, the chief cause of them. An accumulation of unfair profits on the one hand and the specter of unemployment and dwindling savings on the other has forced many consumers to consort with chiselers.

Fighting the chiseler by license enforcement was the hue and cry in the early stages of the milk agreements. But coincident with this demand came the breaking out of old sores in the profit-taking history of dairying. In the light of public opinion (to which governments should not but *do* take heed) there has been a newer and a fresher viewpoint taken on means whereby old abuses may at least be prevented from recurring. We may not know exactly what to do, but we have learned pretty well what *not* to do. I think that in the long run somebody's chestnuts will stay in the fire until they burst!

The bad effects of the chiseler in putting milk producers in the quick-

sands of unstable prices has been amply proven. But in proving that, we have uncovered quite a little fresh grit. It has been shown that in some large city markets in recent years the incomes of two dozen or so executives and managers of corporations have equalled the gross income of more than 900 farms that furnished the men at the hub with their axle grease. On the same market perhaps the union labor working as drivers of milk routes have received minimum weekly wages equal to the current value of a long ton of fresh milk produced in the same seven days.

WHILE organized capital after its profits and organized labor after its preferment skimmed the cream from the market, the agonized farmer took the whey and wondered why.

Yet one who surveys this field calmly and carefully has no judgment or capacity if he gives way to bitter prejudice. Complete correction of the troubles in the milk business cannot come through isolated agreements. Producers themselves must be wide awake to their shortcomings as well as alive to their rights. They have been prone to follow the maudlin reformer without enough internal adjustment.

It is therefore folly to hope for reform through codes of fair practice in the milk business while the entire credit structure and the business objectives of the country require a new deal, whatever that may be and however it may come. In plainer words, when a dose of purgative is needed, why ask for a "milk shake"? You'd simply spend your money without desired results.

There is indeed fresh and vivid hope and joy in the latest movement of the Government, that aiming at removal of burdensome price-breaking excesses and diverting them to the needy. In my travels among the producers of milk and the processors of butter, the usual question was: Why reduce production when there are hundreds starving at our doors?

To resort to that shabby criticism that in using surplus for relief we are making the farmer pay the bill is contrary to the honest warmth of farm opinion as I know it. Farmers know they are only contributing their share toward this fund and that employed consumers pay most of the rest. It is a mutual job. Farmers never shirk their duty. And by casting their bread upon the waters it will come back with more butter and cheese on it than when it was first floated. (We hope.)

On the whole, therefore, I am glad the old cow is in a code. She doesn't know it and keeps on swatting flies and dropping calves regardless. But the effect on her owners and the stewards of her products may prove wholesome and corrective.

I know it is tough for an industry that bragged so long about living on a date-palm and spring-watered oasis to be plunged foot-sore and thirsty into the drifting desert. I know it is difficult for these producers with high standards and expensive methods to survive the crisis. But I also know that recovery for them is not apt to come through embargoes and tariffs alone, or even codes for cows. There must be a sincere and searching readjustment, perhaps a renunciation of old theories and hobbies.

WE are trying compromise measures now, compromising with necessary expedients to fit the machinery we have used so long. So after all, the ordinary dairy cow is only one member of a herd of cows subject to dehorning and clipping. The others are sacred cows which have been milked to death by every sort of industry imaginable. Our old cow can't be controlled until the whole herd is renovated.

Let's keep her well pastured and bedded down, but for Pete's sake we must get abortion out of the rest of the drove or we're sunk!

ELEVEN AGES OF MEN

The eleven ages of men expressed in menu style, run about like this:

Milk.

Milk and bread.

Milk, eggs, bread, and spinach.

Oatmeal, bread and butter, green apples, and all-day suckers.

Ice cream soda and hot dogs.

Minute steak, fried potatoes, coffee, and apple pie.

Bouillon, roast duck, scalloped potatoes, creamed broccoli, fruit salad, divinity fudge, demi-tasse.

Pate de foies gras, wiener schnitzel, potatoes Parisienne, egg plant a l'opera, demi-tasse, and Roquefort cheese.

Two soft-boiled eggs, toast, and milk.

Crackers and milk.

Milk. —*Typo Graphic.*

He: "Let's get married or sumpthing."

She: "We'll get married or nothing!"

WRONG SIDE

Little Algernon (to the old lady who has just arrived, and whom he has never seen before): "So you're my grandmother, are you?"

Old Lady: "Yes, on your father's side."

Algernon: "Well, you're on the wrong side; I'll tell you that right now."—*Texas Weekly.*

The reason we never hear of women after-dinner speakers is that they can't wait that long.

HE SCENTED A BARGAIN

Sandy Macpherson and Maggie, his wife, stopped in front of a restaurant window in which was hung a card bearing the words, "Luncheon from 12 to 2 p.m., 1s. 6d."

"We'll have our lunch here, Maggie," said Sandy. "Two hours' steady eating for 1s. 6d. is no' sae bad."—*Weekly Scotsman.*

He: "I had to come clear across the room to see you, so now I wanna kiss you."

She: "Gosh, I'm glad you weren't in the next block."

TEN REASONS WHY

There is usually only one reason why a man buys, but with a woman it might be any one of ten (so they say)—

1. Because her husband says she can't have it.
2. Because it will make her look thin.
3. Because it's on sale.
4. Because it comes from Paris.
5. Because her neighbors can't afford it.
6. Because she can't afford it.
7. Because nobody has one.
8. Because everybody has one.
9. Because it's different.
10. Because.

COMPLETE EXAMINATION

Girl: I have broken my glasses. Will I have to be examined all over again?

Optician: No, only your eyes.

Good Green FEED

Part of this pasture *at left* received lime and superphosphate. The other part *at right* received lime and well-balanced fertilizer—this increased the green weight yield 7,411 pounds per acre during a dry season.

IT'S a big help to any dairyman to have plenty of good green feed, especially if this feed is produced in his own pasture at low cost. This is why so many progressive dairymen have found that it pays to give each pasture acre 600 pounds of potato fertilizer, broadcast when grass first starts in the spring.

Well-fertilized pastures often yield four to five times as much green weight. Good potato fertilizers, containing plenty of potash, crowd out weeds with succulent grasses and clovers, rich in minerals and protein.

A fertilized pasture not only gives you more good green feed, it also furnishes many extra grazing days. By getting cows out of the barn fifteen days earlier in the spring it more than saves the fertilizer cost by reducing feed bills when money is scarce. Profits begin to pile up when you extend grazing further into the summer dry spell and start grasses quicker in the fall.

POTASH PAYS ON ALL CROPS
NV
POTASH EXPORT MY.
OF AMSTERDAM, HOLLAND
TRADE MARK REG.

You will never know how good your pasture can be until you fertilize it. The most important cash crop on the dairy farm deserves good treatment. Have pride in your pasture. Fill it with clovers and good grasses. Get June grazing early in May. When grass first starts this spring broadcast 600 pounds of potato fertilizer per acre. Your cows will thank you with extra milk.

N. V. POTASH EXPORT MY., Inc., Balt. Trust Bldg., Baltimore, Md.

POTATO FERTILIZER MAKES PASTURES PAY!

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